

SDMS US EPA REGION V -1

**SOME IMAGES WITHIN THIS
DOCUMENT MAY BE ILLEGIBLE
DUE TO BAD SOURCE
DOCUMENTS.**



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 5

77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

February 9, 2001

CERTIFIED MAIL

REPLY TO THE ATTENTION OF:

RETURN RECEIPT REQUESTED

DE-9J

Mr. Robert Hiller
Solutia Inc.
W.G. Krummrich Plant
500 Monsanto Avenue
Sauget, IL 66206-1198

RE: Water Quality Criteria
Solutia Inc.
ILD 000 802 702

Dear Mr. Hiller:

The United States Environmental Protection Agency (U.S. EPA) recently received the validated data for sediment sampled from the Mississippi River on October 24, 2000 through November 3, 2000. Messrs. Alan Faust and Bruce Yare of Solutia Inc. were given a copy of the tabulated results and sample locations during a meeting held at the U.S. EPA, Region 5 office on January 26, 2000. A copy of the results and sample locations are enclosed (Enclosure 1).

Sediment Data - A chart of hazardous constituents found in Mississippi River sediment located upstream, midstream, and downstream of Solutia property (Site R) is provided in Enclosure 2. U.S. EPA data shows that sediment is contaminated with significant concentrations of VOCs and SVOCs starting at the northern edge of Site R. This area is also the approximate northern boundary of a groundwater contaminant plume from the Solutia, W.G. Krummrich facility that discharges to the Mississippi River. Significant concentrations of VOCs and SVOCs in sediment continue along and south of Site R, the approximate southern boundary of the groundwater contaminant plume. Significant concentrations of pesticides, a herbicide, and PCBs were also found near the middle and southern boundary of Site R, in the approximate center of the groundwater contaminant plume.

The areal extent of contaminated sediment in the Mississippi River is best defined by the presence of chlorobenzene at twelve sample locations, 4-chloroaniline at seven sample locations, and benzene at six sample locations. Aniline was also found in sediment at five locations, dichlorobenzenes and Aroclor (PCBs) at four locations, and Δ -BHC at three locations. Other

hazardous constituents found in one or two sediment sample locations are toluene, 1,2-dichloroethane, xylenes, ethylbenzene, 2-chlorophenol, bis(2-ethylhexyl) phthalate, 2,4-dichlorophenol, 3-methylphenol, phenol, chlorobenzilate, 4,4'-DDD, methoxychlor, and 2,4-D. The greatest concentration of contaminants found in sediment occurs near and just south of the middle portion of Site R.

The table presented in Enclosure 3 provides the U.S. EPA, Region 5 Ecological Data Quality Levels (EDQLs) for each hazardous constituent found in Mississippi River sediment. An EDQL is a conservative screening concentration used to determine if the sediment may pose a risk to the environment. Eleven of the twenty-one sample locations (52%) have contaminant concentrations that exceed the Region 5 EDQL. The EDQL was exceeded for chlorobenzene at ten of the twelve sample locations where it was detected, at all sample locations for aniline, at four of seven sample locations for 4-chloroaniline, and at two of four sample locations for PCBs.

Groundwater Data - Solutia groundwater data correlates well with both the type and extent of contamination found in Mississippi River sediment. Groundwater data from May 2000 for wells monitoring the middle and deep sand aquifer near the northern extent of sediment contamination (wells GM-27B and GM-27C) found up to 1,400 ppb of benzene, 11,000 ppb of chlorobenzene, 700 ppb of toluene, 39,000 ppb of aniline, 8,100 ppb of phenol, 300 ppb of 4-chlorophenol, 20,000 ppb of 2-chloroaniline, 25,000 ppb of 3-chloroaniline, and 25,000 ppb of 4-chloroaniline. Chlorobenzene, aniline, and 4-chloroaniline were all found in concentrations in sediment exceeding Region 5 EDQLs, beginning in the area of wells GM-27B and GM-27C.

Historical groundwater data for the Solutia facility from December 1986 through November 1992 was reviewed by U.S. EPA. Again, correlations of groundwater contaminants with sediment data is apparent. Monitoring well locations are provided in Enclosure 4. Wells GM-27B and GM-27C show similar groundwater contamination as determined in May 2000. In nine sampling events, benzene concentration in groundwater ranged from 122 to 9,980 ppb, chlorobenzene concentrations ranged from 193 to 60,200 ppb, toluene concentrations ranged from <6 to 1,400 ppb, aniline concentrations ranged from 869 to 440,000 ppb, phenol concentrations ranged from <1.5 to 1,910 ppb, 2-chloroaniline concentrations ranged from 3,220 to 59,100 ppb, 3-chloroaniline concentrations ranged from <10 to 52,400 ppb, and 4-chloroaniline concentrations ranged from <10 to 53,100 ppb.

Data from wells GM-57C, GM-106, and GM-56C, located near the center of Site R and center of the Solutia, W.G. Krummrich facility plume, shows similar contaminants as found in Mississippi River sediment. In six to eight sampling events, benzene concentrations ranged from <4.4 to 613 ppb, chlorobenzene concentrations ranged from 64 to 7380 ppb, toluene concentrations ranged from 27.7 to 2,070 ppb, aniline concentrations ranged from 2,250 to 44,800 ppb, phenol concentrations ranged from <1.7 to 33,000 ppb, 2-chloroaniline concentrations ranged from <500 to 195,000 ppb, 3-chloroaniline concentrations ranged from <520 to 41,800 ppb, 4-chloroaniline concentrations ranged from 18,600 to 56,900 ppb, and 1,2-dichlorobenzene concentrations ranged from 2.7 to 1260 ppb.

Wells GM-28B, GM-28C, and GM-55C, located near the southern boundary of Site R and southern portion of the Solutia, W.G. Krummrich facility plume, also detected the same contaminants as found in Mississippi River sediment. In seven to ten sampling events, benzene concentrations ranged from 85.5 to 582 ppb, chlorobenzene concentrations ranged from 447 to 47,000 ppb, toluene concentrations ranged from <6 to 533 ppb, aniline concentrations ranged from <1,000 to 24,300 ppb, phenol concentrations ranged from <1.7 to 29,500 ppb, 2-chloroaniline concentrations ranged from 12,000 to 58,100 ppb, 3-chloroaniline concentrations ranged from 9,170 to 52,400 ppb, 4-chloroaniline concentrations ranged from 5,390 to 53,100 ppb, and 1,2-dichlorobenzene concentrations ranged from 6 to 9,810 ppb.

The five most frequently detected contaminants found by U.S. EPA in Mississippi River sediment are chlorobenzene, 4-chloroaniline, benzene, aniline, and 1,4-dichlorobenzene. A comparison of the maximum concentration detected in groundwater in the May 2000 sampling event and the maximum concentration detected in October 2000 sediment sampling is shown below.

Hazardous Constituent	Maximum Detection in Groundwater (ppb)	Maximum Detection in Sediment (ppb)
Chlorobenzene	11,000	10,000
4-chloroaniline	25,000	6,400
Benzene	1,400	58
Aniline	39,000	3,900
1,4-dichlorobenzene	<2,000	1,700

The maximum concentration of hazardous constituents frequently detected in Mississippi River sediment were found at 4% to 91% of the maximum concentration found in groundwater discharging to the Mississippi River. Benzene concentrations in sediment were the lowest compared to the groundwater concentration and chlorobenzene concentrations were the highest. High chlorobenzene concentrations in groundwater continue to be found in the manufacturing portion of the Solutia, W.G. Krumrich facility. Sampling conducted in 1998 found up to 260,000 ppb of chlorobenzene in the shallow groundwater, up to 9,000 ppb in the intermediate aquifer, and up to 1,400 ppb in the deep aquifer.

Chlorobenzene releases from plant operations to groundwater continue to be an ongoing concern as evidenced by a recent October 2 and 3, 2000 release of 1,156 pounds of chlorobenzene to the ground at the Monochlorobenzene Manufacturing Department (see ESDA Incident No. H2000-1879). More recently, 6,700 gallons (58,000 pounds) of chlorobenzene was lost to the subsurface at the Monochlorobenzene Manufacturing Department on January 7 and 8, 2001. A dual-phase extraction system will be installed in an attempt to recover the spilled chlorobenzene.

Water Quality Criteria - Illinois EPA publishes a listing of derived water quality criteria in the Illinois Register pursuant to Section 302.669 of 35 Ill. Adm. Code. The Illinois EPA acute, chronic, and human health criterion for site-related hazardous constituents found in groundwater and sediment at the Solutia facility are presented in Enclosure 5.

Contaminated groundwater from Solutia property that discharges to the Mississippi River along at least a 2000-foot length of the east bank exceeds the criteria for those hazardous constituents presented in Enclosure 5. Historical groundwater data from monitoring wells GM-27B, GM-27C, GM-57C, GM-106, GM-56C, GM-28B, GM-28C, and GM-55C located along the east bank shows that concentrations of site-related contaminants typically exceed acute criterion for chlorobenzene, 1,2-dichlorobenzene, aniline, phenol, 2-chloroaniline, and 4-chloroaniline, and chronic criterion for benzene and toluene.

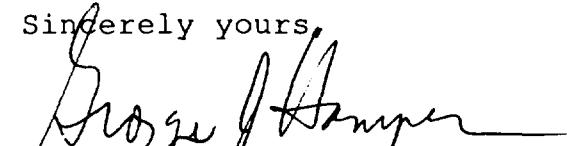
U.S. EPA sediment data from the Mississippi River further documents exceedances of Illinois EPA derived water quality criteria. The sediments are primarily fine to coarse sand with low total organic carbon (TOC). A small area of finer silts with higher TOC occurs at sample locations PDA-2, PDA-3, PDA-4, and SD-5-150. Analyzing sandy sediments with low TOC is likely representative of the pore water within the sand matrix since very little adsorption of organic contaminants would be expected

on the solids. The sediment pore water is likely to be transient groundwater from the sand aquifer discharging to surface water of the Mississippi River.

A comparison of U.S. EPA sediment data found in Enclosure 1 with Illinois EPA derived water quality criteria (see Enclosure 5) shows that nearly all sediment sample locations with detectable concentrations of chlorobenzene, aniline, and 4-chloroaniline exceed the water quality criteria (see Enclosure 6).

Action - Solutia must consider the exceedances of Illinois EPA derived water quality criteria at or from its facility as required by the Administrative Order on Consent, Docket No. R8H-5-00-003. If you have any questions regarding this matter, please contact Kenneth Bardo at (312) 886-7566.

Sincerely yours,



George Hamper, Chief
Corrective Action Section
Enforcement and Compliance Assurance Branch

Enclosures (6)

cc: Gina Search, IEPA-FOS
Jim Moore, IEPA-BOL
Bob Mosher, IEPA-BOW

bcc: Richard Murawski, ORC
Thomas Martin, ORC
Michael McAteer, RRB1
Bruce Sypniewski, ECAB Chief
Kevin Pierard, WNPSPB

DE-9J:KBARDO:6-7566:kb:2/8/01

Solutia Water Quality Criteria

Enclosure 1

TABLE 1
VALIDATED ANALYTICAL RESULTS FOR SOLUTIA INC. SPLIT SAMPLES

Sample Identification	PDA-2-60	PDA-5-R-60	PDA-8-60
Date Collected	October 25, 2000	October 24, 2000	October 26, 2000
Volatile Organic Compounds ($\mu\text{g}/\text{kg}$)			
Acetone	5,800 U	3,300 U	1,400 U
Benzene	1,100 U	260 U	3.40 U
Chlorobenzene	10,000	450	700
1,2-Dichloroethane	1,100 U	110 J	41 J
Methylene chloride	1,100 U	260 U	340 U
Toluene	12,000	140 J	340 U
Xylenes (total)	1,100 U	120 J	340 U
Semivolatile Organic Compounds ($\mu\text{g}/\text{kg}$)			
Aniline	210 J	3,900 J	410 U
4-Chloroaniline	720	3,300	410 U
2-Chlorophenol	580 U	400 J	410 U
1,2-Dichlorobenzene	120 J	780 U	410 U
1,4-Dichlorobenzene	390 J	780 U	410 U
2,4-Dichlorophenol	580 U	610 J	410 U
3-Methylphenol	95 J	780 U	410 U
Phenol	580 U	3,200 J	410 U
2,4,6-Trichlorophenol	580 U	780 U	410 U
2,6-Dichlorophenol	580 U	780 U	410 U
Organochlorine Pesticides ($\mu\text{g}/\text{kg}$)			
Aldrin	6.0 U	4.0 U	2.1 U
alpha-BHC	6.0 U	4.0 U	2.1 U
beta-BHC	6.0 U	4.0 U	2.1 U
delta-BHC	6.0 U	44 J	5.1 J
gamma-BHC (lindane)	6.0 U	4.0 U	2.1 U
Chlordane (technical)	60 U	40 U	21 U
Chlorobenzilate	120 U	21 J	41 U
4,4-DDD	6.0 U	14	2.1 U
4,4-DDE	6.0 U	4.0 U	2.1 U
4,4-DDT	6.0 U	4.0 U	2.1 U
Diallate	120 U	78 U	41 U
Dieldrin	6.0 U	4.0 U	2.1 U

TABLE 1 (continued)

VALIDATED ANALYTICAL RESULTS FOR SOLUTIA INC. SPLIT SAMPLES

Sample Identification	PDA-2-60	PDA-5-R-60	PDA-8-60
Date Collected	October 25, 2000	October 24, 2000	October 26, 2000
Organochlorine Pesticides (µg/kg) (Continued)			
Endosulfan I	6.0 U	4.0 U	2.1 U
Endosulfan II	6.0 U	4.0 U	2.1 U
Endosulfan sulfate	6.0 U	4.0 U	2.1 U
Endrin	6.0 U	4.0 U	2.1 U
Endrin aldehyde	6.0 U	4.0 U	2.1 U
Heptachlor	6.0 U	4.0 U	2.1 U
Heptachlor epoxide	6.0 U	4.0 U	2.1 U
Isodrin	12 U	7.8 U	4.1 U
Kepone	120 U	78 U	41 U
Methoxychlor	12 U	7.8 U	4.1 U
Toxaphene	230 U	160 U	83 U
Polychlorinated Biphenyls (PCB) (µg/kg)			
Aroclor 1016	58 U	39 U	41 U
Aroclor 1221	58 U	39 U	41 U
Aroclor 1232	58 U	39 U	41 U
Aroclor 1242	58 U	39 U	41 U
Aroclor 1248	58 U	84 J	41 U
Aroclor 1254	58 U	39 U	41 U
Aroclor 1260	58 U	39 U	41 U
Herbicides (µg/kg)			
2,4-D	140 U	790	99 U
2,4,5-TP (Silvex)	35 U	24 U	25 U
2,4,5-T	35 U	24 U	25 U
Organophosphorus Pesticides (µg/kg)			
Dimethoate	1,200 U	39 U	41 U
Disulfoton	1,200 U	39 U	41 U
Famphur	1,200 U	39 U	41 U
Methyl parathion	1,200 U	39 U	41 U
Phorate	1,200 U	39 U	41 U
Tetraethylthiopyrophosphate	1,200 U	39 U	41 U
Thionazin	1,200 U	39 U	41 U
o,o,o-Triethylphosphorothioate	1,200 U	39 U	41 U

TABLE 1 (continued)

VALIDATED ANALYTICAL RESULTS FOR SOLUTIA INC. SPLIT SAMPLES

Sample Identification	PDA-2-60	PDA-5-R-60	PDA-8-60
Date Collected	October 25, 2000	October 24, 2000	October 26, 2000
General Chemistry (milligram per kilogram)			
Total organic carbon	11,000	390	510

Notes:

- J = The result was estimated for quality control reasons.
U = The analyte was not detected; the numerical value is the sample reporting limit.
UJ = The analyte was not detected; the sample reporting limit is estimated for quality control reasons.

TABLE 2
VALIDATED ANALYTICAL RESULTS FOR SOLUTIA INC. SEDIMENT SAMPLES

Sample Identification	MR-SD-1-50	MR-SD-1-150	MR-SD-1-300	MR-SD-2-50	MR-SD-2-150
Date Collected	November 1, 2000				
Volatile Organic Compounds (micrograms per kilogram ($\mu\text{g}/\text{kg}$))					
Acetone	22 U	22 U	26 U	24 U	1,300 U
Benzene	5.5 U	5.4 U	6.4 U	5.9 U	55 J
Chlorobenzene	5.5 U	5.4 U	6.4 U	6.5	390
Chloroform	5.5 U	5.4 U	6.4 U	5.9 U	300 U
Ethylbenzene	5.5 U	5.4 U	6.4 U	5.9 U	300 U
Methylene chloride	5.5 U	5.4 U	6.4 U	5.9 U	300 U
Xylenes (total)	5.5 U	5.4 U	6.4 U	5.9 U	300 U
Semivolatile Organic Compounds ($\mu\text{g}/\text{kg}$)					
Aniline	400 U	390 U	390 U	400 U	400 U
bis(2-Ethylhexyl)phthalate	400 U	390 U	390 U	400 U	400 U
4-Chloroaniline	400 U	390 U	390 U	400 U	99 J
1,2-Dichlorobenzene	400 U	390 U	390 U	400 U	400 U
1,3-Dichlorobenzene	400 U	390 U	390 U	400 U	400 U
1,4-Dichlorobenzene	400 U	390 U	390 U	400 U	400 U
Organochlorine Pesticides ($\mu\text{g}/\text{kg}$)					
Aldrin	2.0 U	2.0 U	2.0 U	2.1 U	2.0 U
alpha-BHC	2.0 U	2.0 U	2.0 U	2.1 U	2.0 U
beta-BHC	2.0 U	2.0 U	2.0 U	2.1 U	2.0 U
delta-BHC	2.0 U	2.0 U	2.0 U	2.1 U	2.0 U
gamma-BHC (lindane)	2.0 U	2.0 U	2.0 U	2.1 U	2.0 U
Chlordane (technical)	20 U	20 U	20 U	21 U	20 U
Chlorobenzilate	40 U	39 U	39 U	40 U	40 U
4,4-DDD	2.0 U	2.0 U	2.0 U	2.1 U	2.0 U
4,4-DDE	2.0 U	2.0 U	2.0 U	2.1 U	2.0 U
4,4-DDT	2.0 U	2.0 U	2.0 U	2.1 U	2.0 U
Diallate	40 U	39 U	39 U	40 U	40 U
Dieldrin	2.0 U	2.0 U	2.0 U	2.1 U	2.0 U
Endosulfan I	2.0 U	2.0 U	2.0 U	2.1 U	2.0 U
Endosulfan II	2.0 U	2.0 U	2.0 U	2.1 U	2.0 U
Endosulfan sulfate	2.0 U	2.0 U	2.0 U	2.1 U	2.0 U

TABLE 2 (Continued)**VALIDATED ANALYTICAL RESULTS FOR SOLUTIA, INC. SEDIMENT SAMPLES**

Sample Identification	MR-SD-1-50	MR-SD-1-150	MR-SD-1-300	MR-SD-2-50	MR-SD-2-150
Date Collected	November 1, 2000				
Organochlorine Pesticides (µg/kg) (Continued)					
Endrin	2.0 U	2.0 U	2.0 U	2.1 U	2.0 U
Endrin aldehyde	2.0 U	2.0 U	2.0 U	2.1 U	2.0 U
Heptachlor	2.0 U	2.0 U	2.0 U	2.1 U	2.0 U
Heptachlor epoxide	2.0 U	2.0 U	2.0 U	2.1 U	2.0 U
Isodrin	4.0 U	3.9 U	3.9 U	4.0 U	4.0 U
Kepone	40 U	39 U	39 U	40 U	40 U
Methoxychlor	4.0 U	3.9 U	3.9 U	4.0 U	4.0 U
Toxaphene	80 U	80 U	79 U	81 U	81 U
Polychlorinated Biphenyls (PCB) (µg/kg)					
Aroclor 1016	40 U	39 U	39 U	40 U	40 U
Aroclor 1221	40 U	39 U	39 U	40 U	40 U
Aroclor 1232	40 U	39 U	39 U	40 U	40 U
Aroclor 1242	40 U	39 U	39 U	40 U	40 U
Aroclor 1248	40 U	39 U	39 U	40 U	40 U
Aroclor 1254	40 U	39 U	39 U	40 U	40 U
Aroclor 1260	40 U	39 U	39 U	40 U	40 U
Herbicides (µg/kg)					
2,4-D	96 U	95 U	94 U	97 U	96 U
2,4,5-TP (Silvex)	24 U	24 U	24 U	24 U	24 U
2,4,5-T	24 U	24 U	24 U	24 U	24 U
Organophosphorus Pesticides (µg/kg)					
Dimethoate	40 U	39 U	39 U	40 U	40 U
Disulfoton	40 U	39 U	39 U	40 U	40 U
Famphur	40 U	39 U	39 U	40 U	40 U
Methyl parathion	40 U	39 U	39 U	40 U	40 U
Phorate	40 U	39 U	39 U	40 U	40 U
Tetraethylthiopyrophosphate	40 U	39 U	39 U	40 U	40 U
Thionazin	40 U	39 U	39 U	40 U	40 U
o,o,o-Triethylphosphorothioate	40 U	39 U	39 U	40 U	40 U
General Chemistry (milligram per kilogram)					
Total organic carbon	120 U	120 U	120 U	120 U	120 U

TABLE 2 (Continued)**VALIDATED ANALYTICAL RESULTS FOR SOLUTIA, INC. SEDIMENT SAMPLES**

Sample Identification	MR-SD-2-330	MR-SD-3-25*	MR-SD-3-99	MR-SD-4-90	MR-SD-POP-90
Date Collected	November 1, 2000	November 2, 2000			
Volatile Organic Compounds (micrograms per kilogram [$\mu\text{g/kg}$])					
Acetone	21 U	30 U	160 U	26 U	28 U
Benzene	5.3 U	7.5 U	16 U	4.2 J	7.1 U
Chlorobenzene	5.3 U	7.5 U	3.3 J	100 J	7.1 U
Chloroform	5.3 U	7.5 U	16 U	6.5 U	7.1 U
Ethylbenzene	5.3 U	7.5 U	16 U	2.0 J	7.1 U
Methylene chloride	5.3 U	7.5 U	16 U	6.5 U	7.1 U
Xylenes (total)	5.3 U	7.5 U	16 U	2.6 J	7.1 U
Semivolatile Organic Compounds ($\mu\text{g/kg}$)					
Aniline	380 U	440	220 J	400 U	410 U
bis(2-Ethylhexyl)phthalate	380 U	390 U	390 U	400 U	410 U
4-Chloroaniline	380 U	390 U	130 J	400 U	410 U
1,2-Dichlorobenzene	380 U	390 U	390 U	400 U	410 U
1,3-Dichlorobenzene	380 U	390 U	390 U	400 U	410 U
1,4-Dichlorobenzene	380 U	390 U	390 U	400 U	410 U
Organochlorine Pesticides ($\mu\text{g/kg}$)					
Aldrin	2.0 U	2.0 U	2.0 U	4.1 U	2.1 U
alpha-BHC	2.0 U	2.0 U	2.0 U	4.1 U	2.1 U
beta-BHC	2.0 U	2.0 U	2.0 U	4.1 U	2.1 U
delta-BHC	2.0 U	2.0 U	2.0 U	3.7 J	2.1 U
gamma-BHC (lindane)	2.0 U	2.0 U	2.0 U	4.1 U	2.1 U
Chlordane (technical)	20 U	20 U	20 U	41 U	21 U
Chlorobenzilate	38 U	39 U	39 U	79 U	41 U
4,4-DDD	2.0 U	2.0 U	2.0 U	4.1 U	2.1 U
4,4-DDE	2.0 U	2.0 U	2.0 U	4.1 U	2.1 U
4,4-DDT	2.0 U	2.0 U	2.0 U	4.1 U	2.1 U
Diallate	38 U	39 U	39 U	79 U	41 U
Dieldrin	2.0 U	2.0 U	2.0 U	4.1 U	2.1 U
Endosulfan I	2.0 U	2.0 U	2.0 U	4.1 U	2.1 U
Endosulfan II	2.0 U	2.0 U	2.0 U	4.1 U	2.1 U
Endosulfan sulfate	2.0 U	2.0 U	2.0 U	4.1 U	2.1 U

TABLE 2 (Continued)**VALIDATED ANALYTICAL RESULTS FOR SOLUTIA, INC. SEDIMENT SAMPLES**

Sample Identification	MR-SD-2-330	MR-SD-3-25*	MR-SD-3-99	MR-SD-4-90	MR-SD-POP-90
Date Collected	November 1, 2000	November 2, 2000			
Organochlorine Pesticides (µg/kg) (Continued)					
Endrin	2.0 U	2.0 U	2.0 U	4.1 U	2.1 U
Endrin aldehyde	2.0 U	2.0 U	2.0 U	4.1 U	2.1 U
Heptachlor	2.0 U	2.0 U	2.0 U	4.1 UJ	2.1 U
Heptachlor epoxide	2.0 U	2.0 U	2.0 U	4.1 U	2.1 U
Isodrin	3.8 U	3.9 U	3.9 U	7.9 U	4.1 U
Kepone	38 U	39 U	39 U	79 U	41 U
Methoxychlor	3.8 U	3.9 U	3.9 U	3.4 J	4.1 U
Toxaphene	78 U	80 U	80 U	160 U	84 U
Polychlorinated Biphenyls (PCB) (µg/kg)					
Aroclor 1016	38 U	39 U	39 U	40 U	41 U
Aroclor 1221	38 U	39 U	39 U	40 U	41 U
Aroclor 1232	38 U	39 U	39 U	40 U	41 U
Aroclor 1242	38 U	39 U	39 U	40 U	41 U
Aroclor 1248	38 U	39 U	39 U	40 U	41 U
Aroclor 1254	38 U	39 U	39 U	40 U	41 U
Aroclor 1260	38 U	39 U	39 U	40 U	41 U
Herbicides (µg/kg)					
2,4-D	93 U	96 U	95 U	96 U	100 U
2,4,5-TP (Silvex)	23 U	24 U	24 U	24 U	25 U
2,4,5-T	23 U	24 U	24 U	24 U	25 U
Organophosphorus Pesticides (µg/kg)					
Dimethoate	38 U	39 UJ	39 UJ	40 UJ	41 UJ
Disulfoton	38 U	39 UJ	39 UJ	40 UJ	41 UJ
Famphur	38 U	39 U	39 U	40 UJ	41 U
Methyl parathion	38 U	39 UJ	39 UJ	40 UJ	41 UJ
Phorate	38 U	39 UJ	39 UJ	40 UJ	41 UJ
Tetraethylthiopyrophosphate	38 U	39 U	39 U	40 UJ	41 U
Thionazin	38 U	39 U	39 U	40 UJ	41 U
o,o,o-Triethylphosphorothioate	38 U	39 U	39 U	40 UJ	41 U
General Chemistry (milligram per kilogram)					
Total organic carbon	120 U	120 U	120 U	120 U	130 U

TABLE 2 (Continued)

VALIDATED ANALYTICAL RESULTS FOR SOLUTIA, INC. SEDIMENT SAMPLES

Sample Identification	MR-SD-5-75	MR-SD-5-150	MR-SD-5-315	MR-SD-6-25 ^b	MR-SD-6-90
Date Collected	November 3, 2000				
Volatile Organic Compounds (micrograms per kilogram [$\mu\text{g}/\text{kg}$])					
Acetone	1,300 U	2,500 U	1,300 U	24 U	35 U
Benzene	45 J	58 J	260 U	9.0	0.72 J
Chlorobenzene	1,800	6,700	3,100	82	8.0
Chloroform	370 U	320 U	260 U	6.0 U	5.6 U
Ethylbenzene	370 U	320 U	260 U	6.0 U	5.6 U
Methylene chloride	370 U	320 U	260 U	6.1 U	5.6 U
Xylenes (total)	370 U	320 U	260 U	6.0 U	5.6 U
Semivolatile Organic Compounds ($\mu\text{g}/\text{kg}$)					
Aniline	2,400	3,400	380 U	400 U	400 U
bis(2-Ethylhexyl)phthalate	430 U	430 U	380 U	93 J	400 U
4-Chloroaniline	3,000 J	6,400 J	380 U	400 U	400 U
1,2-Dichlorobenzene	430 U	430 U	380 U	190 J	55 J
1,3-Dichlorobenzene	430 U	430 U	380 U	150 J	400 U
1,4-Dichlorobenzene	300 J	1,700	380 U	330 J	51 J
Organochlorine Pesticides ($\mu\text{g}/\text{kg}$)					
Aldrin	2.2 U	11 U	1.9 U	2.0 U	2.0 U
alpha-BHC	2.2 U	11 U	1.9 U	2.0 U	2.0 U
beta-BHC	2.2 U	11 U	1.9 U	2.0 U	2.0 U
delta-BHC	2.2 U	11 U	1.9 U	2.0 U	2.0 U
gamma-BHC (lindane)	2.2 U	11 U	1.9 U	2.0 U	2.0 U
Chlordane (technical)	22 U	110 U	19 U	20 U	20 U
Chlorobenzilate	43 U	220 U	38 U	40 U	40 U
4,4-DDD	2.2 U	11 U	1.9 U	2.0 U	2.0 U
4,4-DDE	2.2 U	11 U	1.9 U	2.0 U	2.0 U
4,4-DDT	2.2 U	11 U	1.9 U	2.0 U	2.0 U
Diallate	43 U	220 U	38 U	40 U	40 U
Dieldrin	2.2 U	11 U	1.9 U	2.0 U	2.0 U
Endosulfan I	2.2 U	11 U	1.9 U	2.0 U	2.0 U
Endosulfan II	2.2 U	11 U	1.9 U	2.0 U	2.0 U
Endosulfan sulfate	2.2 U	11 U	1.9 U	2.0 U	2.0 U

TABLE 2 (Continued)

VALIDATED ANALYTICAL RESULTS FOR SOLTIA, INC. SEDIMENT SAMPLES

Sample Identification	MR-SD-5-75	MR-SD-5-150	MR-SD-5-315	MR-SD-6-25 ^b	MR-SD-6-90
Date Collected	November 3, 2000				
Organochlorine Pesticides (µg/kg) (Continued)					
Endrin	2.2 U	11 U	1.9 U	2.0 U	2.0 U
Endrin aldehyde	2.2 U	11 U	1.9 U	2.0 U	2.0 U
Heptachlor	2.2 U	11 U	1.9 U	2.0 U	2.0 U
Heptachlor epoxide	2.2 U	11 U	1.9 U	2.0 U	2.0 U
Isodrin	4.3 U	22 U	3.8 U	4.0 U	4.0 U
Kepone	43 U	220 U	38 U	40 U	40 U
Methoxychlor	4.3 U	22 U	3.8 U	4.0 U	4.0 U
Toxaphene	88 U	440 U	77 U	81 U	80 U
Polychlorinated Biphenyls (PCB) (µg/kg)					
Aroclor 1016	43 U	120 J	38 U	40 U	40 U
Aroclor 1221	43 U	43 U	38 U	40 U	40 U
Aroclor 1232	43 U	43 U	38 U	40 U	40 U
Aroclor 1242	43 U	43 U	38 U	40 U	40 U
Aroclor 1248	43 U	43 U	38 U	40 U	31 J
Aroclor 1254	43 U	43 U	38 U	40 U	40 U
Aroclor 1260	43 U	43 U	38 U	40 U	40 U
Organochlorine Herbicides (µg/kg)					
2,4-D	100 U	100 U	92 U	96 U	96 U
2,4,5-TP (Silvex)	26 U	26 U	23 U	24 U	24 U
2,4,5-T	26 U	26 U	23 U	24 U	24 U
Organophosphorus Pesticides (µg/kg)					
Dimethoate	43 U	43 U	38 U	40 U	40 U
Disulfoton	43 U	43 U	38 U	40 U	40 U
Famphur	43 U	43 U	38 U	40 U	40 U
Methyl parathion	43 U	43 U	38 U	40 U	40 U
Phorate	43 U	43 U	38 U	40 U	40 U
Tetraethylthiopyrophosphate	43 U	43 U	38 U	40 U	40 U
Thionazin	43 U	43 U	38 U	40 U	40 U
o,o,o-Triethylphosphorothioate	43 U	43 U	38 U	40 U	40 U
General Chemistry (milligram per kilogram)					
Total organic carbon	200	7,400	110 U	870	1,100

TABLE 2 (Continued)

VALIDATED ANALYTICAL RESULTS FOR SOLUTIA, INC. SEDIMENT SAMPLES

Sample Identification	MR-SD-7-45	MR-SD-7-150	MR-SD-7-280	MR-SD-8-57	MR-SD-9-51
Date Collected	November 3, 2000			October 27, 2000	
Volatile Organic Compounds (micrograms per kilogram [$\mu\text{g}/\text{kg}$])					
Acetone	35 U	1,600 U	22 U	75 U	120 U
Benzene	5.7 U	36 J	5.5 U	6.0 U	6.8 U
Chlorobenzene	2.2 U	1,600	5.5 U	6.0 U	1.6 J
Chloroform	5.7 U	270 U	5.5 U	6.0 U	6.8 U
Ethylbenzene	5.7 U	270 U	5.5 U	6.0 U	6.8 U
Methylene chloride	5.7 U	270 U	5.5 U	6.0 U	6.8 U
Xylenes (total)	5.7 U	270 U	5.5 U	6.0 U	6.8 U
Semivolatile Organic Compounds ($\mu\text{g}/\text{kg}$)					
Aniline	400 U	390 U	390 U	390 U	420 U
bis(2-Ethylhexyl)phthalate	400 U	390 U	390 U	390 U	420 U
4-Chloroaniline	400 U	58 J	390 U	390 U	420 U
1,2-Dichlorobenzene	400 U	390 U	390 U	390 U	420 U
1,3-Dichlorobenzene	400 U	390 U	390 U	390 U	420 U
1,4-Dichlorobenzene	400 U	390 U	390 U	390 U	420 U
Organochlorine Pesticides ($\mu\text{g}/\text{kg}$)					
Aldrin	2.1 U	2.0 U	2.0 U	2.0 U	11 U
alpha-BHC	2.1 U	2.0 U	2.0 U	2.0 U	11 U
beta-BHC	2.1 U	2.0 U	2.0 U	2.0 U	11 U
delta-BHC	2.1 U	2.0 U	2.0 U	2.0 U	11 U
gamma-BHC (lindane)	2.1 U	2.0 U	2.0 U	2.0 U	11 U
Chlordane (technical)	21 U	20 U	20 U	20 U	110 U
Chlorobenzilate	40 U	39 U	39 U	39 U	210 U
4,4-DDD	2.1 U	2.0 U	2.0 U	2.0 U	11 U
4,4-DDE	2.1 U	2.0 U	2.0 U	2.0 U	11 U
4,4-DDT	2.1 U	2.0 U	2.0 U	2.0 U	11 U
Diallate	40 U	39 U	39 U	39 U	210 U
Dieldrin	2.1 U	2.0 U	2.0 U	2.0 U	11 U
Endosulfan I	2.1 U	2.0 U	2.0 U	2.0 U	11 U
Endosulfan II	2.1 U	2.0 U	2.0 U	2.0 U	11 U
Endosulfan sulfate	2.1 U	2.0 U	2.0 U	2.0 U	11 U
Endrin	2.1 U	2.0 U	2.0 U	2.0 U	11 U

TABLE 2 (Continued)

VALIDATED ANALYTICAL RESULTS FOR SOUTIA, INC. SEDIMENT SAMPLES

Sample Identification	MR-SD-7-45	MR-SD-7-150	MR-SD-7-280	MR-SD-8-57	MR-SD-9-51
Date Collected	November 3, 2000			October 27, 2000	
Organochlorine Pesticides (µg/kg) (Continued)					
Endrin aldehyde	2.1 U	2.0 U	2.0 U	2.0 U	11 U
Heptachlor	2.1 U	2.0 U	2.0 U	2.0 U	11 U
Heptachlor epoxide	2.1 U	2.0 U	2.0 U	2.0 U	11 U
Isodrin	4.0 U	3.9 U	3.9 U	3.9 U	21 U
Kepone	40 U	39 U	39 U	39 U	210 U
Methoxychlor	4.0 U	3.9 U	3.9 U	3.9 U	21 U
Toxaphene	81 U	79 U	80 U	79 U	420 U
Polychlorinated Biphenyls (PCB) (µg/kg)					
Aroclor 1016	40 U	39 U	39 U	39 U	42 U
Aroclor 1221	40 U	39 U	39 U	39 U	42 U
Aroclor 1232	40 U	39 U	39 U	39 U	42 U
Aroclor 1242	40 U	39 U	39 U	39 U	42 U
Aroclor 1248	40 U	20 J	39 U	39 U	42 U
Aroclor 1254	40 U	39 U	39 U	39 U	42 U
Aroclor 1260	40 U	39 U	39 U	39 U	42 U
Organochlorine Herbicides (µg/kg)					
2,4-D	97 U	94 U	95 U	94 U	100 U
2,4,5-TP (Silvex)	24 U	24 U	24 U	24 U	25 U
2,4,5-T	24 U	24 U	24 U	24 U	25 U
Organophosphorus Pesticides (µg/kg)					
Dimethoate	40 U	39 U	39 U	39 U	42 U
Disulfoton	40 U	39 U	39 U	39 U	42 U
Famphur	40 U	39 U	39 U	39 U	42 U
Methyl parathion	40 U	39 U	39 U	39 U	42 U
Phorate	40 U	39 U	39 U	39 U	42 U
Tetraethylthiopyrophosphate	40 U	39 U	39 U	39 U	42 U
Thionazin	40 U	39 U	39 U	39 U	42 U
o,o,o-Triethylphosphorothioate	40 U	39 U	39 U	39 U	42 U
General Chemistry (milligram per kilogram)					
Total organic carbon	780	120 U	120 U	120 U	3,700

TABLE 2 (Continued)

VALIDATED ANALYTICAL RESULTS FOR SOLUTIA, INC. SEDIMENT SAMPLES

Notes:

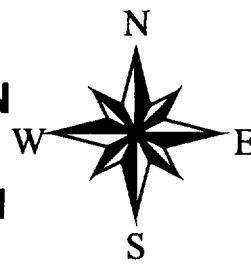
J = The result was estimated for quality control reasons.
U = The analyte was not detected; the numerical value is the sample reporting limit.
UJ = The analyte was not detected; the sample reporting limit is estimated for quality control reasons.

- a Field duplicate of sample MR-SD-3-99.
b Field duplicate of sample MR-SD-6-90.



1000 0 1000 2000 Feet

- TETRA TECH
SAMPLING LOCATION
- MENZIE-CURA
SAMPLING LOCATION



SOLUTIA FACILITY, SAUGET, ILLINOIS
SAMPLING LOCATIONS
ADJACENT TO SITE R

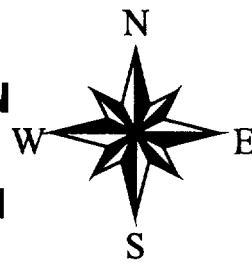


TETRA TECH EM INC.



6000 0 6000 12000 Feet

- TETRA TECH SAMPLING LOCATION
- MENZIE-CURA SAMPLING LOCATION



SOLUTIA FACILITY, SAUGET, ILLINOIS
UPSTREAM AND DOWNSTREAM
SAMPLING LOCATIONS



TETRA TECH EM INC.

Significant Detections of Organic Hazardous Constituents in Mississippi River Sediments at the Solutia, Saugat, IL Facility
(Shaded Box Indicates Significant Detection of Hazardous Constituent Above Background)

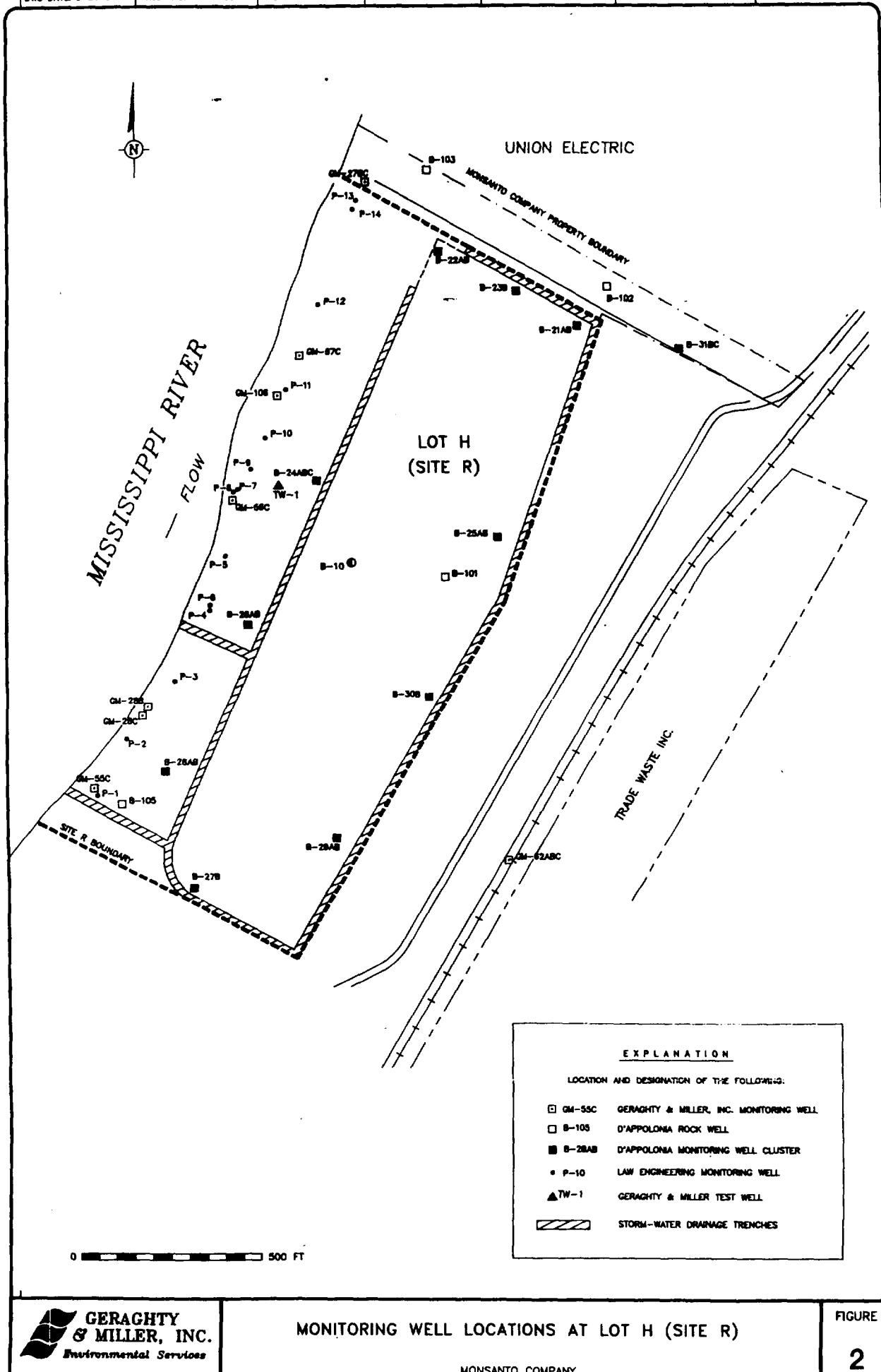
Sediment Sample Location Number and Relationship to Site R of the Solutia Facility
 (Last Number in Sample Location is Distance in Feet from Riverbank)

Enclosure 2

Enclosure 3

Hazardous Constituent	EDQL in μg/kg (ppb)	Number of Sample Locations > EDQL
chlorobenzene	62	10
aniline	0.034	5
4-chloroaniline	146	4
PCBs	34	2
ethylbenzene	0.1	1
p-dichlorobenzene (1,4)	1,450	1
2,4-D	5.8	1
4,4'-DDD	5.5	1
3-methylphenol (m-cresol)	0.845	1
2-chlorophenol	11.7	1
2,4-dichlorophenol	133.6	1
phenol	27.3	1
benzene	142	0
toluene	52,500	0
o-dichlorobenzene (1,2)	3,010	0
m-dichlorobenzene (1,3)	231	0
xylenes	1,880	0
Δ-BHC	71,500	0
methoxychlor	3.6	0
chlorobenzilate	860	0
bis(2-ethylhexyl)phthalate	182	0

Enclosure 4



Enclosure 5

Hazardous Constituent	Acute Criterion (ppb)	Chronic Criterion (ppb)	Human Health Criterion (ppb)
Chlorobenzene	993	79	-
Aniline	120	15	84
4-chloroaniline	2.4 -	(0.2)	800
PCBs	-	0.014*	-
Ethylbenzene	220	17	-
2-chlorophenol	510	41	130
2,4-dichlorophenol	631	83.1	-
Phenol	100**	-	-
Benzene	1,300	110	21
Toluene	1,300	110	-
1,2-dichlorobenzene	210	16.8	-
1,3-dichlorobenzene	500	196	-
Xylenes	1,500	120	-

() - Advisory

* - National Recommended Criterion Continuous Concentration (63 FR 68359).

** - IAC 302.208

Enclosure 6

Hazardous Constituent	Sediment Locations Exceeding Acute Criterion	Sediment Locations Exceeding Chronic Criterion	Sediment Locations Exceeding Human Health Criterion
Chlorobenzene	PDA-2-60, SD-5-75, SD-5-150, SD-5-315, and SD-7-150	PDA-5-R-60, PDA-8-60, SD-2-150, SD-4-90, and SD-6-25 (dup)	
Aniline	PDA-2-60, PDA-5-R-60, SD-3-99 and SD-3-25 (dup), SD-5-75, and SD-5-150		PDA-2-60, PDA-5-R-60, SD-3-99 and SD-3-25 (dup), SD-5-75, and SD-5-150
4-chloroaniline	PDA-2-60, PDA-5-R-60, SD-2-150 SD-3-99, SD-5-75, SD-5-150, and SD-7-150		PDA-5-R-60, SD-5-75, and SD-5-150
PCBs*		PDA-5-R-60, SD-5-150 SD-6-90, and SD-7-150	
2-chlorophenol		PDA-5-R-60	PDA-5-R-60
2,4-dichlorophenol		PDA-5-R-60	
Phenol	PDA-5-R-60		
Benzene			SD-2-150, SD-5-75, SD-5-150, and SD-7-150
Toluene	PDA-2-60	PDA-5-R-60	
1,2-dichlorobenzene		PDA-2-60, and SD-6-90 and SD-6-25 (dup)	

* - National Recommended Criterion Continuous Concentration (63 FR 68359).